ON INFERRING RESOURCE-ALLOCATIONAL
IMPLICATIONS FROM DRC CALCULATIONS
IN TRADE-DISTORTED OPEN ECONOMIES

J. N. Bhagwati & T. N. Srinivasan[*]

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The trade-and-developmental policy and theoretic literature has utilized the concept of DRCs--domestic resource costs expended in earning a unit of foreign exchange--in analyzing trade-distorted open economies.

While the basic concept, in some sense, goes back to the early Israeli studies brought to general attention in Bruno (1972), it has been utilized in a number of modern empirical studies, such as Krueger's (1966) pioneering examination of Turkish exchange controls, and in many of the recent DRC calculations by analysts of trade policy in less developed countries-- e.g. Behrman (1977) for Chile, Bhagwati-Srinivasan (1976) and Panchamukhi for India, and Leith (1976) for Ghana.

While, however, the concept (widely referred to as the Bruno-Krueger DRC concept) and its measurements are popular, it is not evident what precise resource-allocational implications are to be inferred from it. That resource-allocational inferences are indeed to be made is, on the other hand, evident from the proponents' claims: see, for example, Krueger (1972, p. 61) and Balassa and Schydlowsky (1972, p. 63).

This paper is addressed to examining what resource-allocational inferences can and what cannot be made. In so doing, it also demonstrates that, depending on which kind of resource-allocational inference is intended, the DRC concept must be appropriately different. This demonstration should help in clarifying and relating to one another the many important contributions to the DRC concept in the existing literature.

I

Now, the standard DRC concept, with attendant calculations, in an open economy characterized only by (ad valorem) trade or product-market distortions and by the traditional production-cum-trade structure of trade theory, [Krueger (1972, p. 61)], amounts to:

$$DRC_i^I = \frac{\hat{p}_i - \sum\limits_{k=1}^{n} \hat{a}_{ki}\hat{p}_k}{p_i^* - \sum\limits_{k=1}^{n} \hat{a}_{ki}p_k^*} \qquad i = k = 1,\ldots,n \qquad (1a)$$

$$= \frac{\sum\limits_{j=1}^{n} \hat{b}_{ji}\hat{w}_j}{p_i^* - \sum\limits_{k=1}^{n} \hat{a}_{ki}p_k^*} \qquad j = 1,\ldots,n \qquad (1b)$$

where there are n tradeable goods (k = i = 1,...,n); n primary factors which are fixed in domestic endowment (j = 1,...,n); the $\hat{a}_{ki}$s are the intermediate-use coefficients on tradeables in the distorted equilibrium; $\hat{b}_{ji}$s are the unit primary-factor-use requirements in the distorted equilibrium; p_i^*s are the given world prices of the tradeables; $\hat{p}_i$s are the trade-distorted domestic prices of the tradeables; and $\hat{w}_j$s are the corresponding (equilibrium-associated) trade-distorted domestic prices of the primary factors. Notation to be used below will also include $\hat{w}_j^*$s as the "second-best" shadow factor prices, associated with p_i^*s and the distorted factor-use and intermediate-use coefficients.

Although it is claimed that, in the presence of factor market distortions, the factor valuations in the numerator of (1b) should be adjusted for "shadow prices" in place of the market prices ($\hat{w}_j$s), it is argued (Krueger, 1972) that (1b) is the correct DRC concept if the distortions are either (ad valorem) trade or product market distortions.

The different activities in the distorted equilibrium can therefore be ranked according to their DRCs, so defined, and the analyst presumably can thereby infer how to select "among investment alternatives"; Krueger (1972, p. 60).

Note, to begin with, that the ranking of the activities in the distorted

equilibrium by DRC^I will be identical with their ranking by ERP (effective rate of protection) since ERP is the distortion-caused increment in value added divided by the value added at world prices, so that:

$$ERP = DRC^I - 1 \tag{2}$$

However, it is not quite clear what <u>exactly</u> is meant by the proponents of this concept when they recommend its use for "selecting among investment alternatives." To probe this issue in depth, we may turn now to the simplified two-tradeables, two-primary-factors model of trade theory.

Thus, in Figure 1, there are two tradeables, 1 and 2, with equilibrium production at P* under free trade (at the given world prices p_1^*/p_2^*) and at $\hat{P}$ under the distorted domestic price-ratio $\hat{p}_1/\hat{p}_2$. With no intermediate usage and with only two primary factors, 1 and 2, we then note immediately that, in the distorted equilibrium at $\hat{P}$:

$$DRC_1^I = \frac{\hat{b}_{11}\hat{w}_1 + \hat{b}_{21}\hat{w}_2}{p_1^*} \tag{3}$$

$$DRC_2^I = \frac{\hat{b}_{12}\hat{w}_1 + \hat{b}_{22}\hat{w}_2}{p_2^*} \tag{4}$$

In our highly-simplified diagrammatic model, therefore, $DRC_1^I < DRC_2^I$ implies that:

$$\frac{p_1^*}{p_2^*} > \frac{\hat{b}_{11}\hat{w}_1 + \hat{b}_{21}\hat{w}_2}{\hat{b}_{12}\hat{w}_1 + \hat{b}_{22}\hat{w}_2} \tag{5}$$

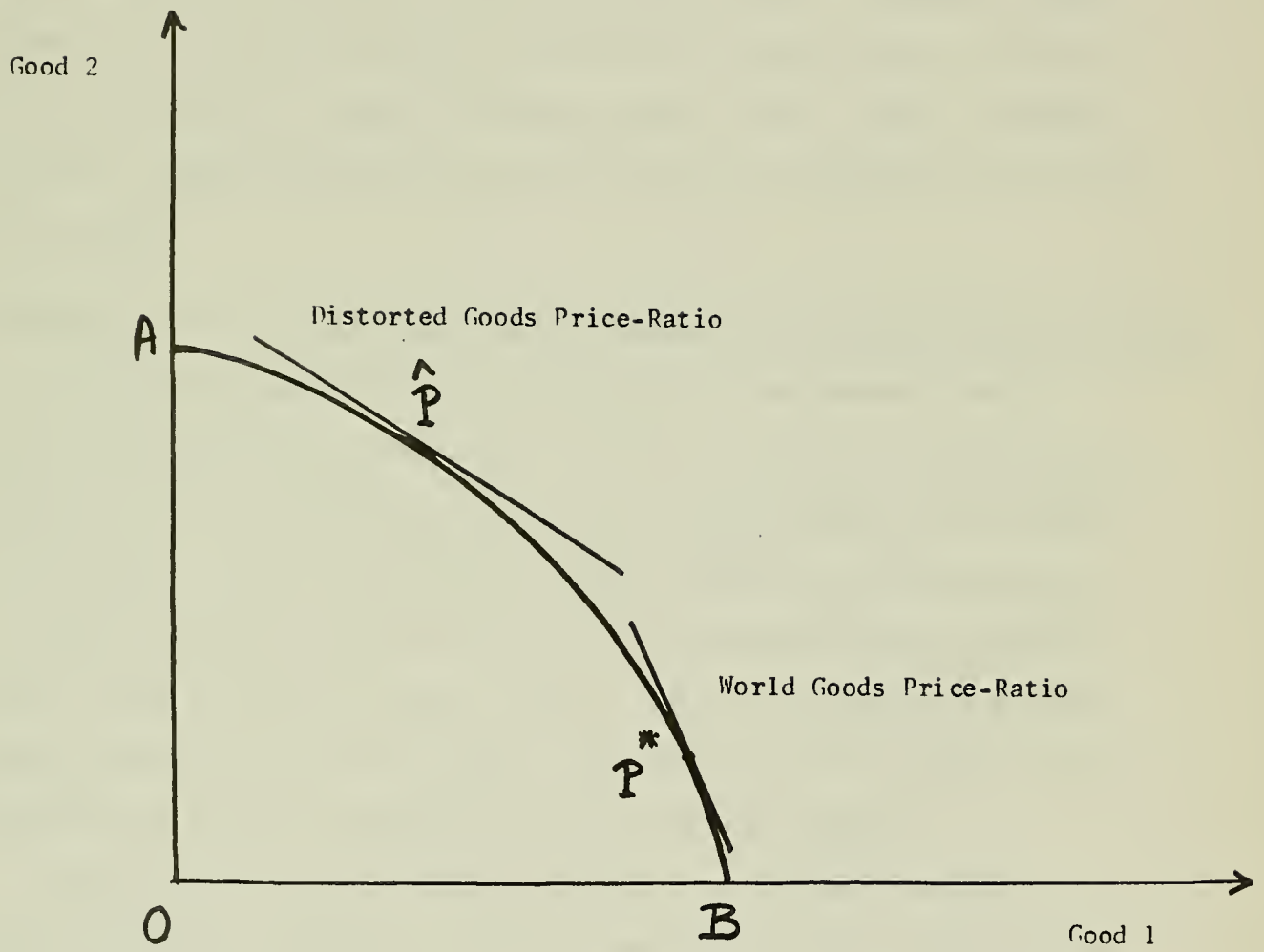i.e. $$\frac{p_1^*}{p_2^*} > \frac{\hat{p}_1}{\hat{p}_2} \tag{6}$$

FIGURE (1)

since the factor-cost ratio equals the goods price-ratio in the distorted

equilibrium at $\hat{P}$: the absence of intermediate usage in either activity leads

to this neat result for, otherwise, the numerators and denominators in (3)

and (4) would show value-added rather than output values. Thus $DRC_1^I < DRC_2^I$

implies that the distorted goods price-ratio has a lower (relative) price of

good 1 and a protected, higher (relative) price of good 2. What "investment

allocation" guidance can then follow from this? Two alternative possibilities

may be defined.

Interpretation (1): Resource-Allocational Change vis-a-vis Free Trade Equilibrium

It may be argued that what the DRC-ranking at the observed trade-

distorted equilibrium (at $\hat{P}$ in Figure 1) does is to indicate the direction in

which output or value-added will shift if the distortion were to be removed.

I.e. in Figure 1, the fact that $DRC_1^I < DRC_2^I$ is supposed to indicate that P*,

the optimal free-trade production point, will be characterized by a higher

output of good 1 and lower output of good 2. This is, of course, the same

thing as asserting that if $ERP_1 > ERP_2$, output or value added in good 1 will

be lowered and in good 2 increased when free trade is restored.

This resource-allocational interpretation has nothing to do with

project-analysis as customarily understood and is rather the central problem

of ERP theory in general equilibrium. While in the highely simplified model

of trade theory in Figure 1, this inference is valid for output and for

value-added (which are identical because of the absence of intermediates),

we now know that the inference can be made only under particularly stringent

restrictions on either production functions or the tariff structure under

more general models permitting the use of intermediates and allowing for

generalized substitution among inputs.[*]

DRC^{I}s, used in this way, are therefore really in the territory defined by traditional ERP theory: and this territory is not highly productive of sufficiency conditions for correct resource-allocational inferences from the DRC^I (or ERP, equivalently) rankings of the activities in the trade-distorted equilibrium.

But if this is indeed the resource-allocational use of DRC^I rankings that is intended, it is clear that the argument occasionally made by DRC$_I$ proponents that in the presence of factor market imperfections the DRC^{I}s must be adjusted such that shadow-price factor valuations are utilized (in the numerator of (1b)) becomes somewhat puzzling. For, what _are_ these shadow prices to be? And, are the re-defined DRC^{I}s, using such shadow prices, to indicate the direction of gross output or value added change when free trade is restored, with the factor market imperfection _or_ without it?

Thus, take the case of a factor wage differential imperfection. This will result in a shrinking in of the production possibility curve from AP*B to AP̂B and a non-tangency between the goods price-ratio and the production possibility curve. Now, P̂ is the observed trade-distorted equilibrium in this case. If free trade were allowed with the wage differential in place, equilibrium production would shift to P̂*. However, if we eliminated the wage differential as well, production would shift to P*. Now, P̂* is to the

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[*] The investigation of these sufficiency restrictions, for both gross output changes and value added changes in very general models is to be found in Bruno (1973), Bhagwati and Srinivasan (1973) and Sendo (1974). There is a great body of literature on this subject, preceding these writings, but it is in partial-equilibrium models or deals wtih general-equilibrium models with simplifying restrictions on the tariff structure or on the production functions, thus reaching conclusions which were dependent on the simplifying assumptions and whose general implications were therefore not sufficiently appreciated.

south-east of $\hat{P}$; but P* is to the north-west of $\hat{P}$. Which directional

inference is the redefined DRC^I, using the shadow prices, supposed to enable

one to make?* And, even if we were to choose $\hat{P}$*, for convenience, and look

for an appropriately adjusted DRC^I index which <u>could</u> predict accurately the

direction of change from $\hat{P}$ to $\hat{P}$*, it is unclear what that modification would

have to be.

ERP theory, which has been worked out for models where the only "imper-

fection" arises in the form of tariffs, has had such limited success that

one's first reaction might be that, in a factor-market-imperfection model,

ERP theory may break down altogether in the sense that no ERP-DRC^I type index

may be devisable which could predict resource-allocational changes vis-a-vis

the free-trade outcome on gross outputs or value added. On the other hand,

it is also <u>possible</u> that the <u>unadjusted</u> DRC^I index may well suffice for this

purpose under suitable restrictions: as would appear to be in the case

illustrated in Figure 2.** What <u>is</u> clear is that there is (in the absence

of theoretical analysis centering on the above questions) little meaning to

be attached to the recommendation to use "shadow price"-adjusted DRC^Is when

factor market distortions are present.

Interpretation (2): Marginal Change from Trade-Distorted Equilibrium

An alternative interpretation of the resource-allocational implications

of DRC^I rankings at the trade-distorted equilibrium is that they indicate

that it would pay the economy to increase the production of the lower DRC

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*Besides, as Bhagwati and Srinivasan (1971) and Herberg and Kemp (1971) have
noted, multiple equilibria may result, so that another $\hat{P}$* may exist to the
left of $\hat{P}$ on A$\hat{P}$B as well.

**For complexities arising from multiple equilibria and possibility of
perverse output response to goods price-ratio change, however, see Bhagwati
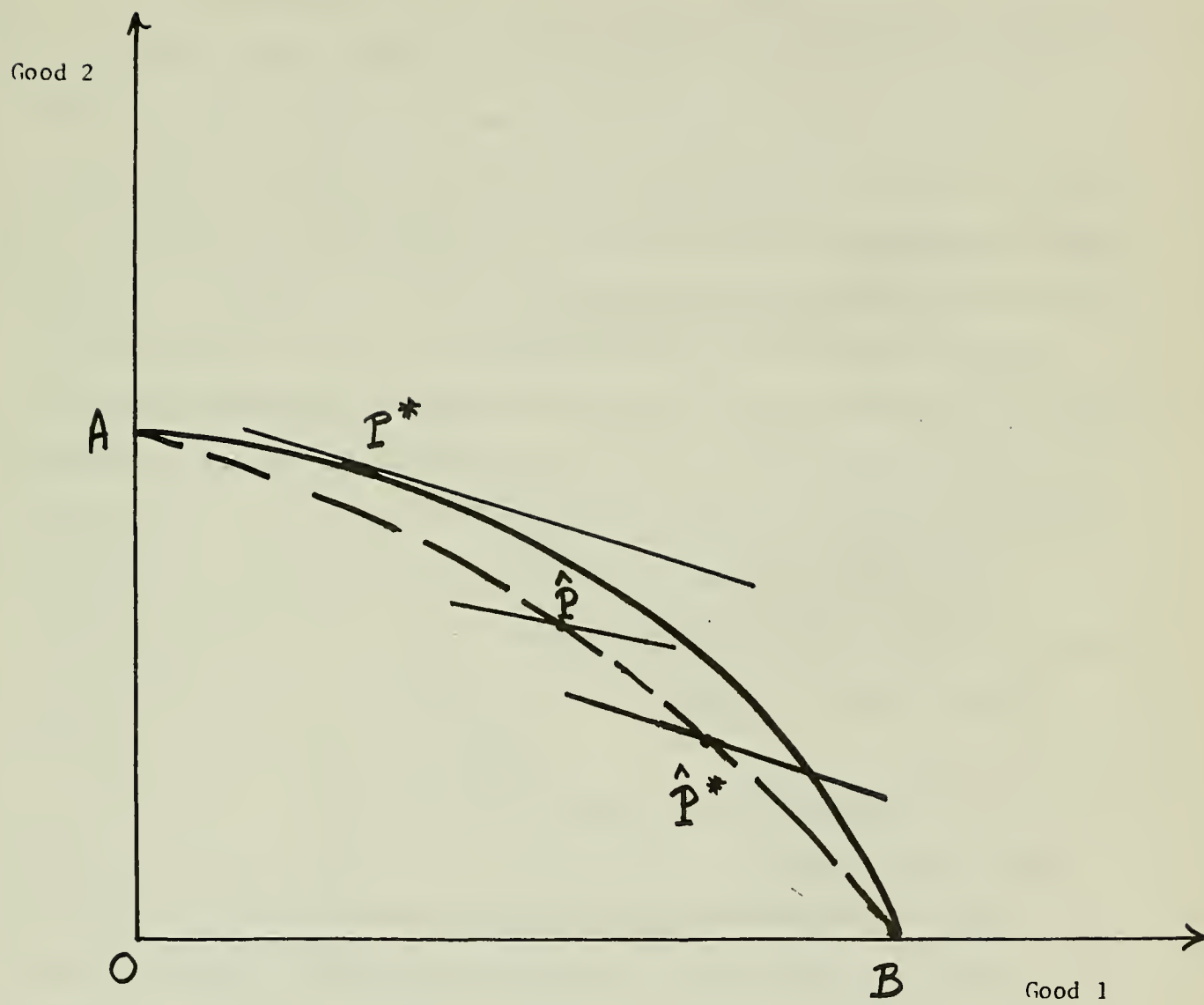and Srinivasan (1971) and Kemp and Herberg (1971).

FIGURE (2)

activities at the expense of the higher DRC activities: Kruger (1972

This seems like a perfectly innocuous implication; but, in fact, it conceals

important difficulties as well.

To see these best, turn to Figure 3. With trade-distorted production at

$\hat{P}$, and therefore $DRC_1^I < DRC_2^I$, it is evident that a policy that manages to

raise the output of good 1 and lower that of good 2, but at a rate less

favorable than the world price-ratio $\hat{PR}$, will not improve welfare but worsen

it. The range of such possibilities is defined by the "welfare-deterioration"

cone $Q\hat{P}R$. An example of a policy that would shift the production vector into

this cone is where factor 2 is withdrawn for use in a new third activitiy,

the economy moves therefore down the Rybczynski line $\hat{PB}'$ defined by the changed

endowment of factors for producing goods 1 and 2 at the given distorted price-

ratio $\hat{PS}$, and the world price-ratio line is flatter than this Rybczynski-line.

Any policy that moves the production point strictly into this cone will

result in a reduced value of national production measured at the world prices,

thus implying, a la Little-Mirrlees (1969) and well-known trade-theoretic

arguments, a deterioration of welfare.

The moral is evident. The DRC^I rankings of activities at $\hat{P}$ do not, in

themselves, make it possible for us to infer that any marginal change from

the higher to the lower DRC activities will improve welfare. The answer

depends critically on the actual rate of this transformation in domestic

production at the margin: and this obviously depends on the policy defining the

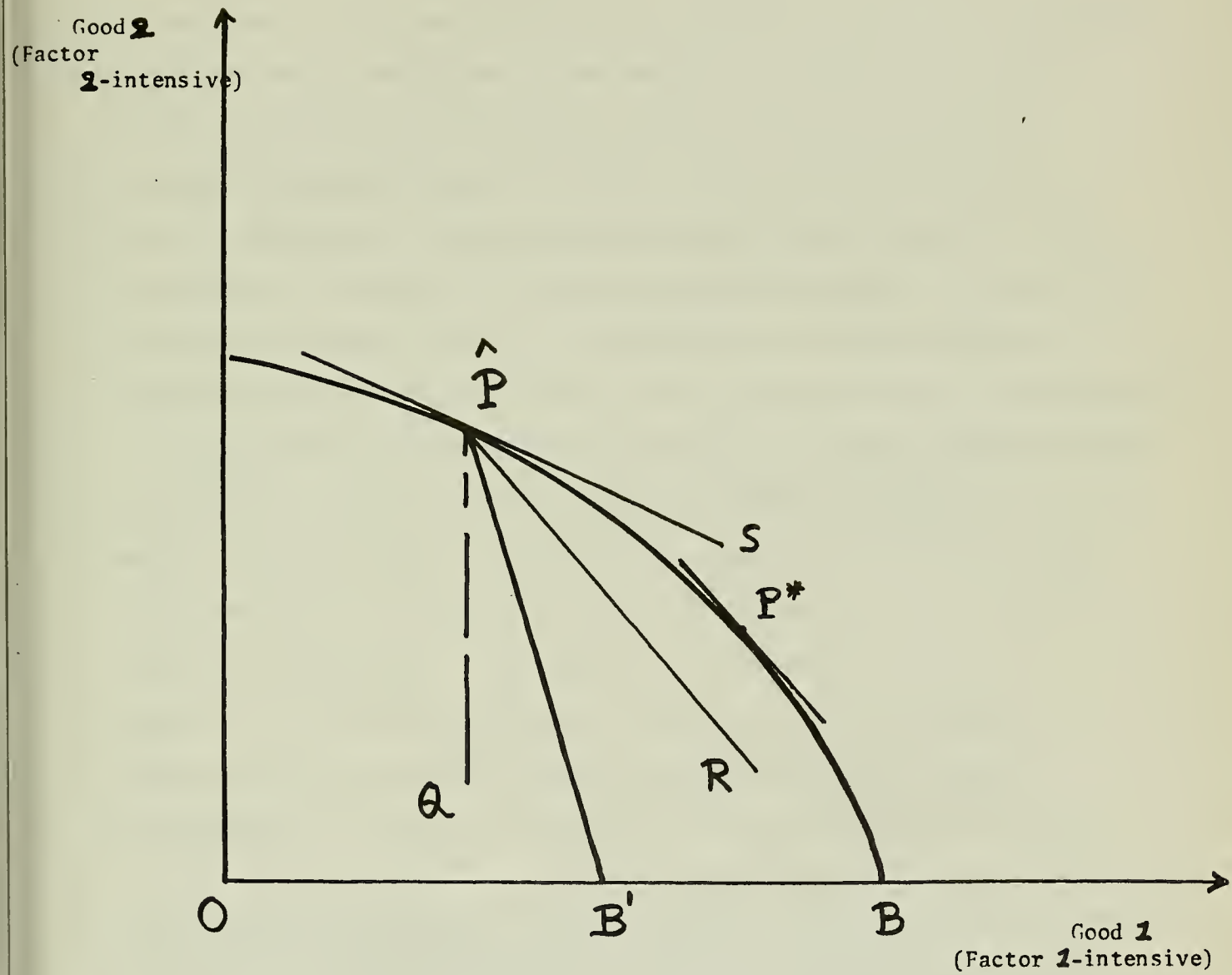transformation. Evidently, Krueger's argumentation implicitly presumes that

FIGURE (3)

the policy change will necessarily move the economy outside of the welfare-deterioration cone; but this need not be the case.

In fact, an excellent example of a "policy" that is a matter of serious concern to "resource-allocating" policymakers, and where one obviously cannot make such a presumption, is the selection or rejection of a (small) project which will draw primary factors away from $\hat{P}$, while the economy's distorted incentives at $\hat{P}$ remain in place. This, in fact, is the subject matter of "second-best" project-evaluation analysis which takes the economy to be subject to a given set of distortions and then evaluates the desirability of undertaking a (small) project that withdraws resources for project-use from the existing distorted allocation, taking these distortions as unchangeable.[*]

On the other hand, if the fact that DRC^I_is are different among activities in the trade-distorted equilibrium is used to argue a much weaker proposition, namely, that some marginal reallocation of resources will necessarily exist at this trade-distorted equilibrium which will improve welfare, this would be a valid inference indeed. But, except in the two-activity model of Figures 1-3, the inference could not be made that such welfare-improving marginal re-allocation would necessarily imply increasing the outputs or values-added in the lower DRC^I activities and contracting them in the higher

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[*] Thus, as Srinivasan-Bhagwati (1977) have argued in such a context elsewhere, DRC^I rankings, extended to the project in question, cannot be used as a criterion for project selection in the presence of distortions, in the sense that the project should be accepted if its DRC^I happens to be below that of existing activities (at $\hat{P}$) in the distorted equilibrium. Note that, whether the project produces a good already being produced (at $\hat{P}$) in the distorted equilibrium or a new good is immaterial.

DRC^I activities. I.e. the chain formed by ranking activities in the trade-distorted equilibrium by their DRC^Is can indeed be criss-crossed by a welfare-improving marginal reallocation of primary factors.

<div align="center">II</div>

However, if <u>Interpretation (2)</u> above is desired and DRC^I rankings of activities in the trade-distorted equilibrium do not provide the correct criterion to make resource-allocational choices regarding policy changes that result in reallocation of factors among the alternative activities (including new ones), not all is lost. For, a suitably amended DRC^{II} measure can indeed be devised which will permit the analyst to so rank activities and make the correct allocational choice for a restricted class of policy changes.

This alternative DRC^{II} concept, which has been put forth/for project-selection in the presence of (<u>ad valorem</u>) trade distortions by Srinivasan and Bhagwati (1977), is simply the following:

$$DRC^{II}_i = \frac{\sum_{j=1}^{n} \hat{b}_{ji} \hat{w}^*_j}{p^*_i - \sum_{k=1}^{n} \hat{a}_{ki} p^*_k} \tag{7}$$

where $\hat{w}^*_j$ are the appropriately derived second-best factor prices.[*] In fact, these shadow prices are derived by putting the numerator equal to the denominator for the activities at the trade-distorted equilibrium [$\hat{P}$ in Figures 1-3] so that, at this observed equilibrium, DRC^{II}s are equal to unity and hence to one another. Thus, if DRC^{II}_p for the project is less than unity, we will have the rank-ordering:

$$DRC^{II}_{i=1,\ldots n} \equiv 1 > DRC^{II}_p \tag{8}$$

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[*]While this explicit DRC formulation is, to our knowledge, first put down in Srinivasan-Bhagwati (1977), the notion of appropriate second-best factor prices is of course to be found in the analyses of project evaluation.

and it can be shown that the project should indeed be accepted.

Thus, revert to the simple model underlying Figure 3, with two goods, 1 and 2, being produced at the distorted equilibrium $\hat{P}$. Consider now a project producing a unit of good 3, with the trade distortion (and hence the unit coefficients in production at $\hat{P}$) continuing <u>unchanged</u>. Let the project have unit coefficients b_{13}^p and b_{23}^p, in the use of the two factors, 1 and 2. Then, according to the well-known Little-Mirrlees (1969) rule as also standard trade-theoretic analysis, the project would be accepted as welfare-improving if:

$$p_3^* > dX_1 p_1^* + dX_2 p_2^* \tag{9}$$

i.e. if the value of total production (of goods 1, 2 and 3), measured at <u>world</u> prices, increases. But we may, for small projects, also write:

$$dX_1 p_1^* + dX_2 p_2^* = b_{13}^p \hat{w}_1^* + b_{23}^p \hat{w}_2^* \tag{10}$$

i.e. derive the shadow "second-best" prices ($\hat{w}^*$ s) of the factors used in the project such that the corresponding social cost equals the loss in output of goods 1 and 2 (i.e. dX_1 and dX_2) evaluated at world prices.

Solving for dX_1 and dX_2, given the fixed $\hat{b}_{ki}$s at $\hat{P}$ owing to the assumption of unchanged trade distortion, the reader will find that the shadow prices of the factors (w_1^* and w_2^*) are nothing but the solutions to the two equations:

$$p_1^* = \hat{b}_{11} \hat{w}_1^* + \hat{b}_{21} \hat{w}_2^* \tag{11}$$

$$p_2^* = \hat{b}_{12} \hat{w}_1^* + \hat{b}_{22} \hat{w}_2^* \tag{12}$$

as is evident from Diamond-Mirrlees (1976), Srinivasan and Bhagwati (1977), Findlay and Wellisz (1976) and Bhagwati and Wan (1977). Note that the

second-best shadow prices, $\hat{w}_1^*$ and $\hat{w}_2^*$, so derived reflect the fact that the goods prices continue to be distorted and hence do not change as primary factors are withdrawn (from $\hat{P}$) for the project: this, in turn, implying that the associated market prices of factors ($\hat{w}_1$ and $\hat{w}_2$) are also fixed and hence the unit requirements of factors in the production of the two goods remain fixed at $\hat{b}_{11}$, $\hat{b}_{21}$, $\hat{b}_{12}$ and $\hat{b}_{22}$.

But, (9) and (10) on the one hand, and (11) and (12) on the other, imply that:

$$DRC_3^{II} = \frac{b_{13}^P \hat{w}_1^* + b_{23}^P \hat{w}_2^*}{p_3^*} < 1 \qquad (13)$$

$$DRC_1^{II} = \frac{\hat{b}_{11} \hat{w}_1^* + \hat{b}_{21} \hat{w}_2^*}{p_1^*} = 1 \qquad (14)$$

and

$$DRC_2^{II} = \frac{\hat{b}_{12} \hat{w}_1^* + \hat{b}_{22} \hat{w}_2^*}{p_2^*} = 1 \qquad (15)$$

Therefore, evidently the acceptability of the project on criterion (9) is identical to its acceptance on criterion (8) and the rank-ordering by DRC_s^{II} will indeed lead to the correct resource-allocational implications.

Note that this DRC^{II}-ranking criterion applies equally to projects that produce a good already being produced in the trade-distorted equilibrium. In that case, the DRC^{II} of such a project-produced good should be less than unity while, of course, it is set at unity for the techniques used to produce it in the trade-distorted equilibrium. It is instructive to see, however, that the DRC^{II}-ranking criterion, when satisfied, ensures that, in Figure 3, the economy does move out of $\hat{P}$ to somewhere outside of the welfare-deterioration cone, $Q\hat{P}R$. Thus, for a project producing a unit of good 1, its acceptability,

i.e. $DRC^{II} < 1$ for the project, implies that:

$$p_1^* > b_{11}\overset{p}{\hat{w}}_1^* + b_{21}\overset{p}{\hat{w}}_2^*$$

i.e. $$p_1^* > dX_1 p_1^* + dX_2 p_2^*$$

i.e. $$p_1^*(1 - dX_1) > dX_2 p_2^*$$

i.e. $$p_1^*/p_2^* > dX_2/(1 - dX_1) \tag{16}$$

where the R.H.S. defines the effective, <u>net</u> rate of transformation between the output of goods 1 and 2 at the trade-distorted equilibrium. It is immediately evident then that the satisfaction of the inequality in (16) would, in Figure 3, move the economy from $\hat{P}$ to outside of the welfare-deterioration cone $Q\hat{P}R$.

A few observations are in order. First, while it is possible evidently to compute shadow factor prices such that DRC^{II} rankings, using those, can yield in turn the correct resource-allocational inference, this possibility is confined to those cases where the trade distortion is in place and marginal moves, subject to this constraint, are being considered. The technique clearly cannot be extended to marginal changes which change the trade distortion itself: e.g. a policy change in the tariff rate(s) or a project selection in the presence of <u>quantitative</u> trade restrictions (which will generally imply, even for small changes, varying implicit tariffs). Second, our analysis shows that the DRC^{II} measure, when appropriately used, implies the use of second-best shadow price valuations of factors even when the factor markets are perfect; the DRC^{I} measure is inappropriate even when only tariffs define the distortion. Third, if factor market imperfections are also present,

the DRC^{II}-ranking technique will still work, though the second-best factor prices will now reflect these imperfections as well.[*]

Finally, while DRC^I clearly is inappropriate for determining whether a project with lower DRC than the existing activities in the trade-distorted equilibrium should be accepted, and DRC^{II} is the correct concept to be used in this context, it may be useful to note that we can establish two sufficiency theorems when the inappropriate DRC^I rankings will nonetheless yield the correct evaluation of the project. Thus consider the two-good case again, with the project producing good 3 and resulting in changes in outputs (dX_1 and dX_2) of goods 1 and 2. Assume then that:

$$\text{DRC}_1^I \leq \text{DRC}_2^I, \quad \text{i.e.} \quad \frac{\overline{P}_1}{\overset{*}{P}_1} \leq \frac{\overline{P}_2}{\overset{*}{P}_2}.$$

Then we can demonstrate the following two propositions:

<u>Proposition (I)</u>: If $\text{DRC}_3^I > \text{DRC}_2^I$ and $dX_1 \geq 0$, then $\text{DRC}_3^{II} > 1$ and the project should be rejected. Thus, the rank-ordering of DRC^Is (i.e. $\text{DRC}_3^I > \text{DRC}_2^I \geq \text{DRC}_1^I$) yields the correct project evaluation.

<u>Proposition (II)</u>: If $\text{DRC}_3^I < \text{DRC}_1^I$ and $dX_2 \geq 0$, then $\text{DRC}_3^{II} < 1$ and the project should be accepted. Thus, the rank-ordering of DRC^Is (i.e. $\text{DRC}_3^I < \text{DRC}_1^I \leq \text{DRC}_2^I$) yields the correct project evaluation.

<u>Proof (I)</u>: $\quad \text{DRC}_3^I = \dfrac{\hat{p}_1 dX_1 + \hat{p}_2 dX_2}{\overset{*}{P}_3} > \text{DRC}_2^I \quad$ by hypothesis

$$\hat{p}_1 dX_1 + \hat{p}_2 dX_2 = p_1^* \text{DRC}_1^I dX_1 + p_2^* \text{DRC}_2^I dX_2$$

$$\leq \text{DRC}_2^I [p_1^* dX_1 + p_2^* dX_2] \quad \text{if } dX_1 \geq 0 \text{ and } \text{DRC}_1^I \geq \text{DRC}_2^I$$

Hence $\quad \text{DRC}_2^I < \dfrac{\hat{p}_1 dX_1 + \hat{p}_2 dX_2}{\overset{*}{P}_3} \leq \text{DRC}_2^I \left[\dfrac{p_1^* dX_1 + p_2^* dX_2}{\overset{*}{P}_3} \right]$

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[*] Shadow factor prices in the presence of three different types of factor market imperfections have been considered in Srinivasan and Bhagwati (1977).

But $DRC_2^I > 0$ and $\dfrac{p_1^* dX_1 + p_2^* dX_2}{p_3^*} = DRC_3^{II}$. Thus $DRC_3^{II} > 1$; i.e. the project should

be rejected. Q.E.D.

<u>Proof (II)</u>: Given $DRC_3^I = \dfrac{\hat{p}_1 dX_1 + \hat{p}_2 dX_2}{p_3^*} < DRC_1^I$

$$\hat{p}_1 dX_1 + \hat{p}_2 dX_2 = p_1^* DRC_1^I dX_1 + p_2^* DRC_2^I dX_2$$

$$\geq DRC_1^I [p_1^* dX_1 + p_2^* dX_2] \text{ if } dX_2 \geq 0 \text{ and } DRC_1^I \leq DRC_2^I$$

Hence $DRC_1^I > \dfrac{\hat{p}_1 dX_1 + \hat{p}_2 dX_2}{p_3^*} \geq DRC_1^I \left[\dfrac{p_1^* dX_1 + p_2^* dX_2}{p_3^*} \right]$

Again, since $DRC_1^I > 0$ and $\dfrac{p_1^* dX_1 + p_2^* dX_2}{p_3^*} = DRC_3^{II}$, we get $DRC_3^{II} < 1$,

i.e. that the project should not be rejected. Q.E.D.

<div align="center">III</div>

It would thus appear that DRC^I, defined in terms of market prices of
factors in the trade-distorted equilibrium, is appropriately addressed, like
the ERP measure that it is generally equivalent to, to the question of in-
ferring the output and value-added changes resulting from the trade distortion
vis-a-vis the free trade equilibrium. On the other hand, DRC^{II}, defined in
terms of the second-best shadow prices of factors, is appropriately addressed
to the very different question of project evaluation in the presence of
unchangeable trade distortions. <u>Both</u> questions are "resource-allocational"
in nature; but their resolution as also the DRC concepts appropriate to such
resolution are different in nature.

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Srinivasan, T. N. and Jagdish Bhagwati, 1977, "Shadow Prices for Project Selection in the Presence of Distortions: Effective Rates of Protection and Domestic Resource Costs," Journal of Political Economy, December; (M.I.T. Economics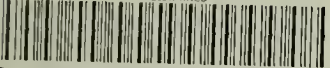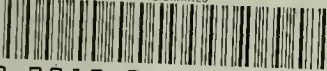 Department Working Paper No. 180, July 1976).